

P-7.6 Summarize the production of continuous, emission, or absorption spectra

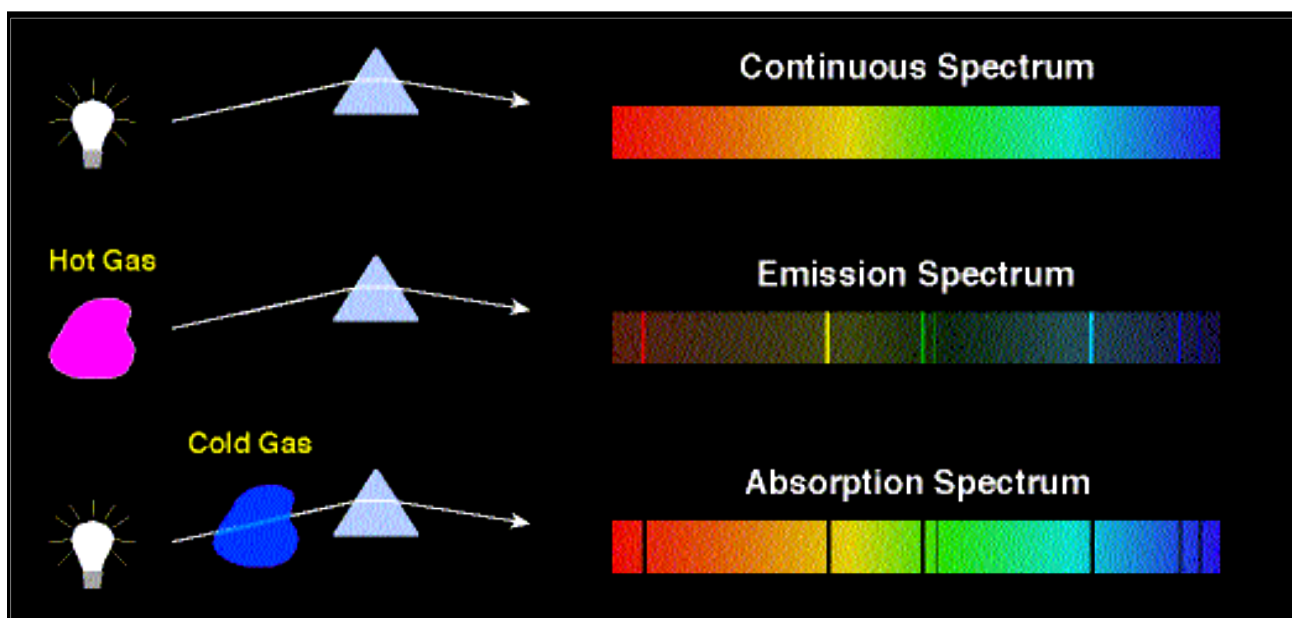
Revised Taxonomy Level 2.4 Summarize conceptual knowledge

Students did not address this topic in physical science

It is essential for students to

- ❖ Understand the origin of Continuous, Emission, and Absorption Spectra
 - When materials are made to glow, the electrons in their atoms jump to orbits of higher energy levels. As the electrons fall back to the ground state, the light from each different element produces its own characteristic pattern of lines because each element has its own distinct configuration of electrons, and these emit distinct frequencies of light when electrons change from one energy state to another.
 - A continuous spectrum
 - Generally, solids, liquids, or dense gases emit light at all wavelengths when heated to a glow.
 - This type of spectrum results from high pressure gasses or in solids and liquids because atoms are crowded together, causing many collisions among the particles.

➤ **An emission spectrum**



- Is produced by exciting a low density gases in which the atoms do not experience many collisions (because of the low density).
- The emission lines correspond to photons of discrete energies that are emitted when excited atomic states in the gas make transitions back to lower-lying levels.

➤ **An absorption spectrum**

- Is produced when light passes through a cold, dilute gas and atoms in the gas absorb the light at characteristic frequencies; since the re-emitted light is unlikely to be emitted in the same direction as the absorbed photon, this gives rise to dark lines (absence of light) in the spectrum.

Assessment

The revised taxonomy verb summarize means “to abstract a general theme or major point” For this indicator, the major focus of assessment should be to insure that students have a conceptual understanding of the three types of spectra that elements can emit Conceptual knowledge requires that students understand the interrelationships among the basic elements within a larger structure that enable them to function together. In this case, that students understand how the light emitted by the atoms appears to us.